

Paper Title:

An Approach to System Design and Management Decisions Based on a Biological Metaphor.

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Extended Abstract:

An approach to system design and management decisions based on a biological metaphor is presented. At the core of this approach is using the idea that the system design and management decisions that lead to the formation of the system, and the evolution of those decisions, create situations in a manner very similar to the way genetic material does in biological organisms. Possibilities for the use of information theory to create analytic tools with which to analyze systems based on this metaphor are presented. The results of this perspective it is believed can enhance system design and management decision making processes.

First the notion of system "conception" and its implications are explored. An analogy with the cellular differentiation that occurs shortly after conception is used as a context to examine the viability of complex system development. The possibility for the use of information theory to create analytic tools with which to analyze systems based on this analogy are presented. "Nature vs. nurture" and the relationship with "parent" systems are discussed.

An analogy between the chemical stability of genetic material, and the stability of system design and management decisions is investigated. The notion of "replication errors" and possible means to understand and track their entry into the system development are discussed. The possibility for the use of information theory to create analytic tools with which to analyze systems based on this analogy are presented.

A comparison of "genetic longevity" and (system) life cycle suggests some new approaches to system design and management decision making, particularly in the area of contractual agreements.

An analogy between organ transplants and the addition of new members to projects is examined. The implications for development based on a common set of design and management decisions, as well as potential analytic perspectives are discussed.

Finally, the notion of system legacy is discussed. Suggestions for additional project development success metrics are given.

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